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Physics 30, Mr. Kapphahn

**Rocket Lab**

Purpose:

The purpose of this project was to use a model rocket to examine some of the major concepts that we have studied in Physics 30.

Materials:

* Plastic wrap tube
* White glue
* Hot glue
* Balsa wood
* Straw
* Contact cement
* Foam
* Tape
* Styrofoam
* Paper clip
* Dime role
* Thread
* Plastic bag
* Bungee cord
* Paper
* Stickers
* Spray paint
* Exacto knife
* Pliers

Procedure:

1. The body of our rocket is an empty plastic wrap tube.
2. We cut fins out of balsa wood that we bought at the co-op hardware store. We used a pattern that we found on the internet.
3. We cut a straw into quarters, and then glued it on beside one of the fins so that our rocket would be held in place when it was launched.
4. We glued the fins onto the body of our rocket with hot glue. We had to reinforce our fins with more hot glue along the sides so that they were more stable.
5. We cut out a square of Styrofoam and then molded a nosecone with a hot knife.
6. We used tape to cover up the nosecone.
7. To make our parachute we used an old plastic grocery bag. We cut out a circle that was the diameter of our rocket, and then cut a smaller hole in the center of it so that our rocket would fall faster.
8. We then cut 6 pieces of thread, folded them, and then taped them onto the sides of the parachute.
9. We sewed the ends of the thread together, and then sewed the strings onto a bungee cord.
10. We attached the bungee cord to the nosecone by using hot glue.
11. The bungee cord was glued to the inside of the rocket by hot glue, and then reinforced with a piece of folded paper and white glue.
12. To make our “engine holder” we used foam and cut them into rings and glued them into the inside of our rocket.
13. We bent a paper clip on the outside of a dime role so that it would hold the engine in place.
14. The paper clip then got taped and glued on the outside of the dime role.
15. The whole dime role was then glued onto the foam rings on the inside of our rocket.
16. To finish off our rocket we painted it silver, and then after it was dry put brightly coloured heart and star stickers on it.

Data & Analysis

1st Trial:

* Our takeoff was a success
* Our rocket was controlled
* Our recovery system did not deploy
* There were no broken parts on our rocket

Our rocket had a very successful takeoff, and had a controlled flight. Our nosecone was in to tightly, or there was too little wadding which lead to our recovery system getting burnt, and not deploying externally. When our rocket landed there were no broken parts.

2nd Trial:

* Our takeoff was a success
* Our rocket was not controlled
* Our recovery system did not deploy
* There were no broken parts on our rocket

Our rocket had a very successful takeoff the during the 2nd trial. We tried to loosen our nosecone, which made our rocket not have a controlled flight. Our recovery system was burnt during our 1st flight, so it did not deploy. Our rocket did not have any broken parts.

Sources of Error

Our nosecone had tape on the outside of it so it was not very aerodynamic. To make it more aerodynamic, the knife needed to be heated up a lot hotter so that it would of melted the Styrofoam, which would of made a smoother cut. Another source of error was that the engine did not fit as snugly in the dime role as would of been expected. Our dime role should of been more packed into the end of our rocket so that the engine would of fit tighter inside of it. The last source of error was that our recovery system did not deploy. Our nosecone fit to tightly on the end of our rocket, which caused our recovery system to not deploy.

Conclusion

The rocket had successful takeoffs both trials, and overall worked very well. Our recovery system did not deploy, and if we were able to build another rocket we would of changed how aerodynamic our rocket was by building a smoother nosecone, and we would of built a tighter “engine holder”. We are very proud that we built a rocket that flew well, and did not break. This project was a very uplifting experience and we would definitely be excited to do another assignment like this one!